NCEP & CPC Update

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NOAA/NESDIS

NCEP Upgrades and Initiatives

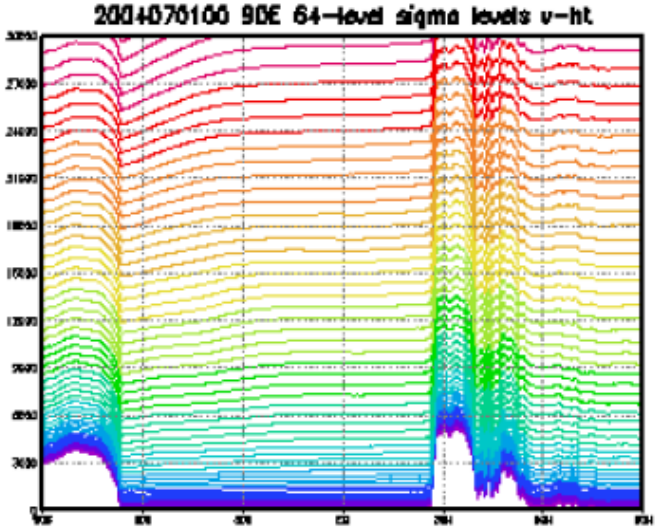
- Model horizontal resolution increased to T382/L64. (2004)
- AQUA-AIRS radiances assimilated. (May 2005)
- Model concept changes
  - Single system, single analysis, single verification
  - ESMF compatible superstructure
    - Earth System Modeling Framework
- New ozone P/L code implemented. (Aug. 2006)
- Hybrid (sigma-pressure) ready
- New IBM computers being installed this Fall 2006.
- JCSDA funded projects implemented.
  - Surface emissivity model for snow and ice
  - Ozone P/L code
- Global Ensemble Forecasts implemented (Aug 2005)
  - T120/L64 14 runs per cycle out to 16 days.
- Climate Forecast System

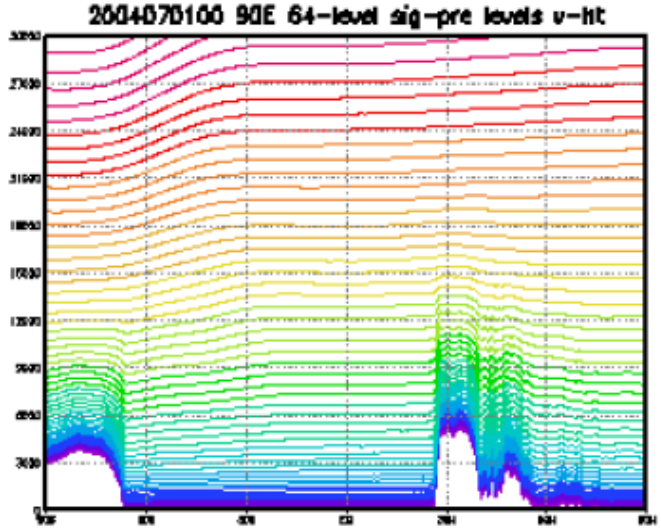
NCEP Future Installments and Initiatives

- Analysis and Observations
  - Gridpoint Statistical Interpolation (GSI) Analysis
  - SSM/I radiances (replaces retrieved wind speeds, adds total column water vapor)
- Forecast Mode
  - Ice shelf physics
  - Hybrid sigma-pressure vertical coordinate

GFS hybrid levels (by height)

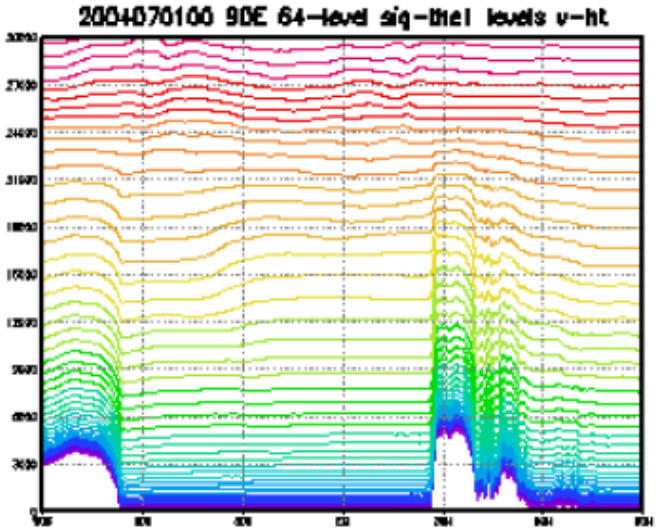
sigma (operational)

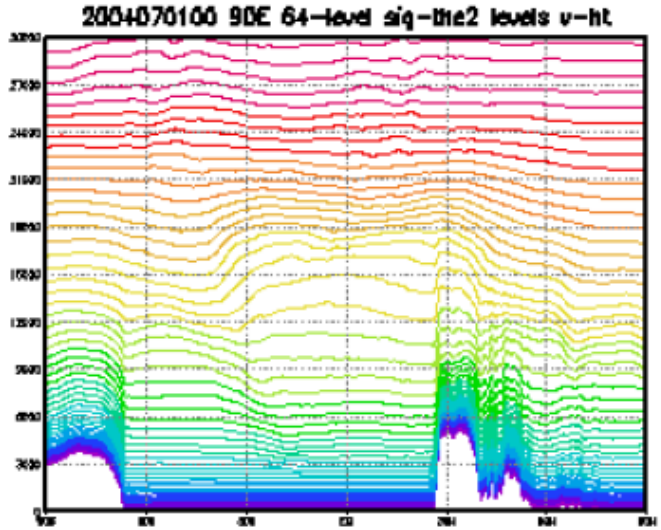




sigma-pressure

sigma-isentropic (1)





sigma-isentropic (2)

NCEP Mission Requirements
&
Forecast Suite Elements

Suite Elements	Global NWP	Meso NWP	Fire Wx Rapid Update Reg. Hurricane	Air Quality	Global Ensembles	Meso Ensembles	Real Time Ocean	S/I Climate
NCEP	X	X	X	X	X	X	X	X
UKMO	X	X		X		X	X	
ECMWF	X				X			X

AIRS Radiance Assimilation Impacts

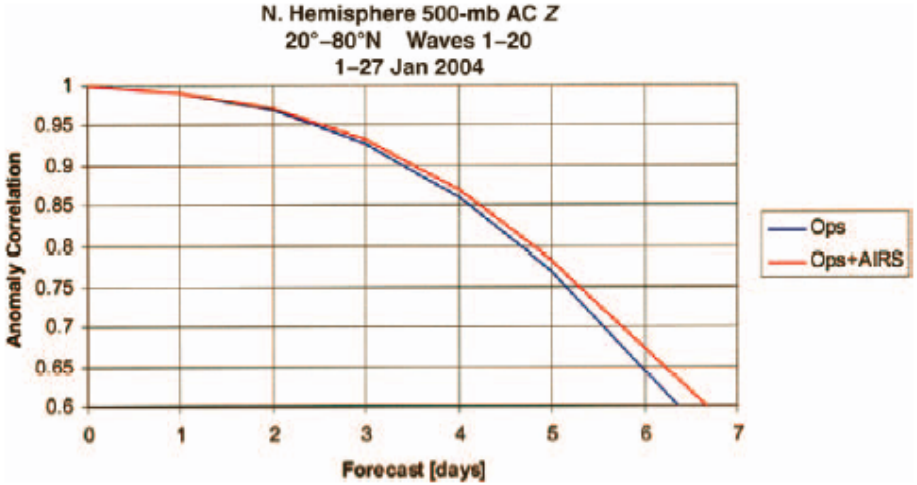


FIG. 4. 500-hPa Z anomaly correlations for the GFS with (Ops + AIRS) and without (Ops) AIRS data, Northern Hemisphere, January 2004.

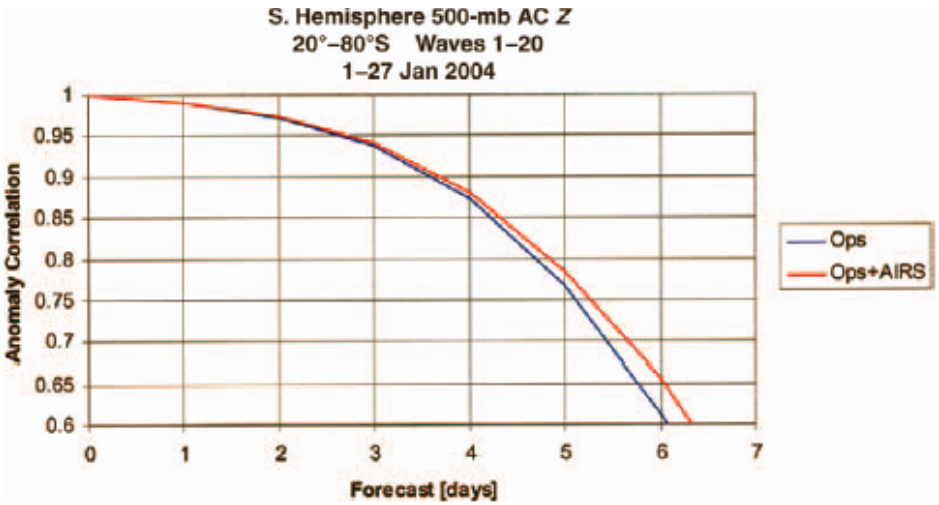


FIG. 2. 500-hPa Z anomaly correlations for the GFS with (Ops + AIRS) and without (Ops) AIRS data, Southern Hemisphere, January 2004.

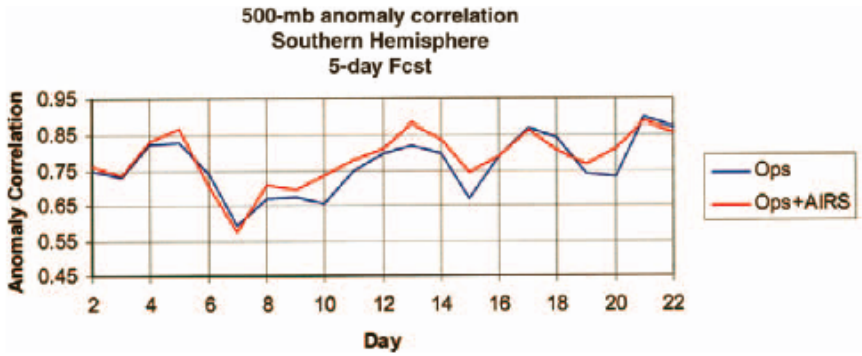
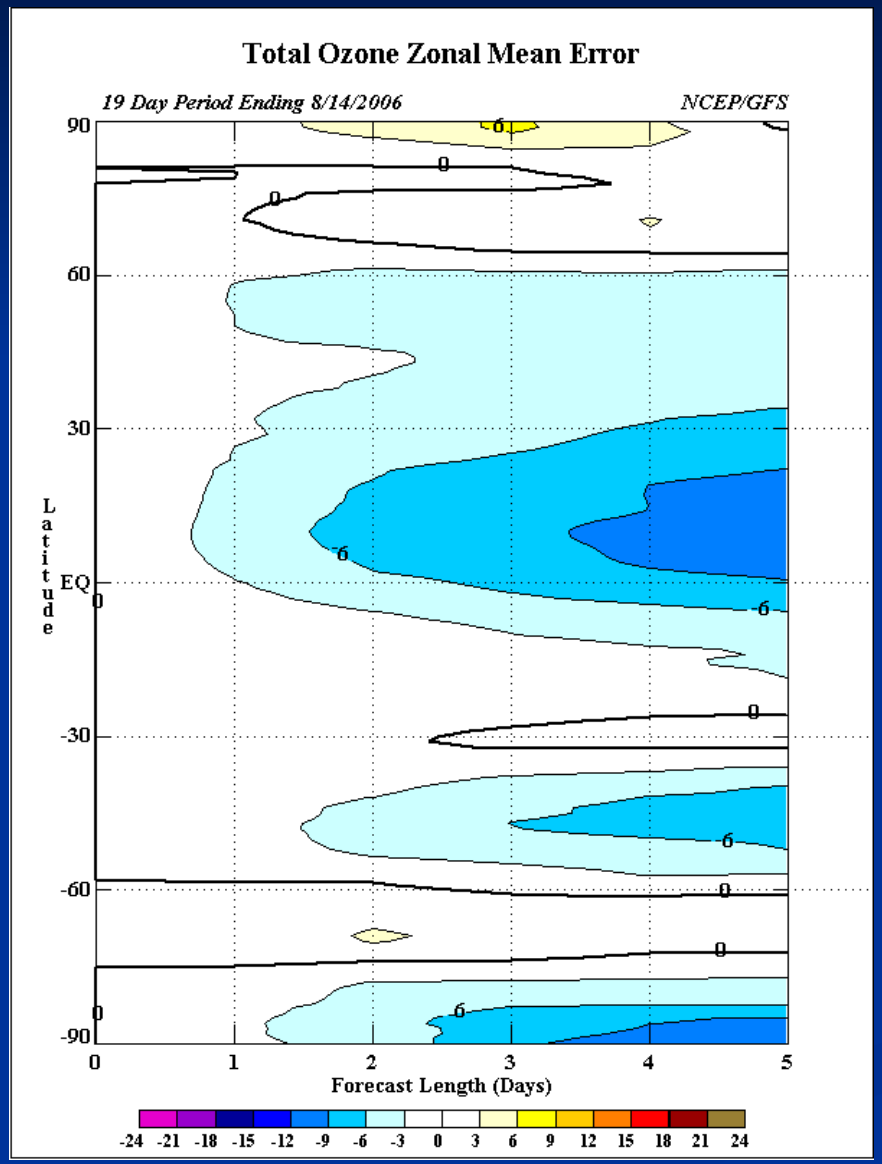


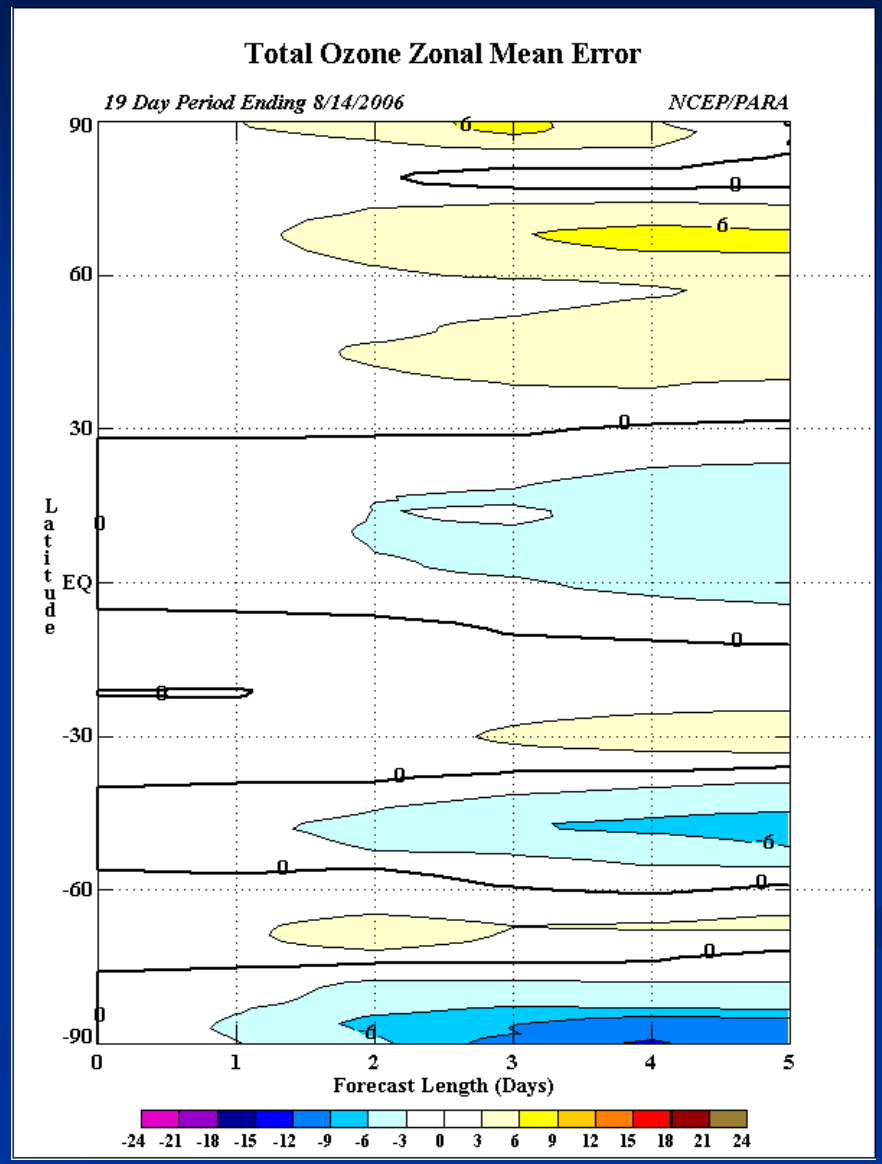
FIG. 3. Daily 500-hPa Z anomaly correlation for 5-day forecasts for the GFS with (Ops + AIRS) and without (Ops) AIRS data, Southern Hemisphere, January 2004.

NRL P/L Code Impacts

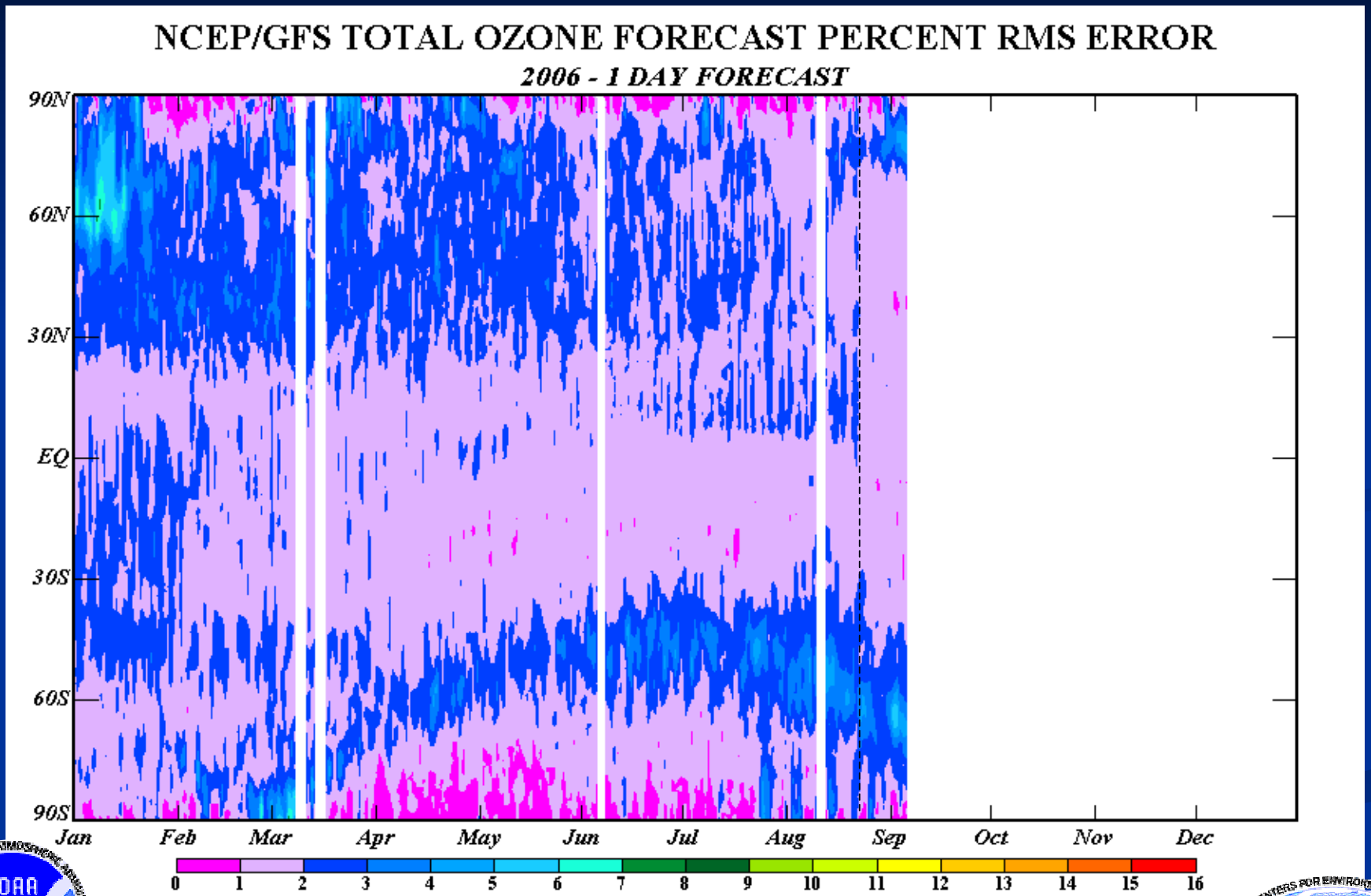
Operational



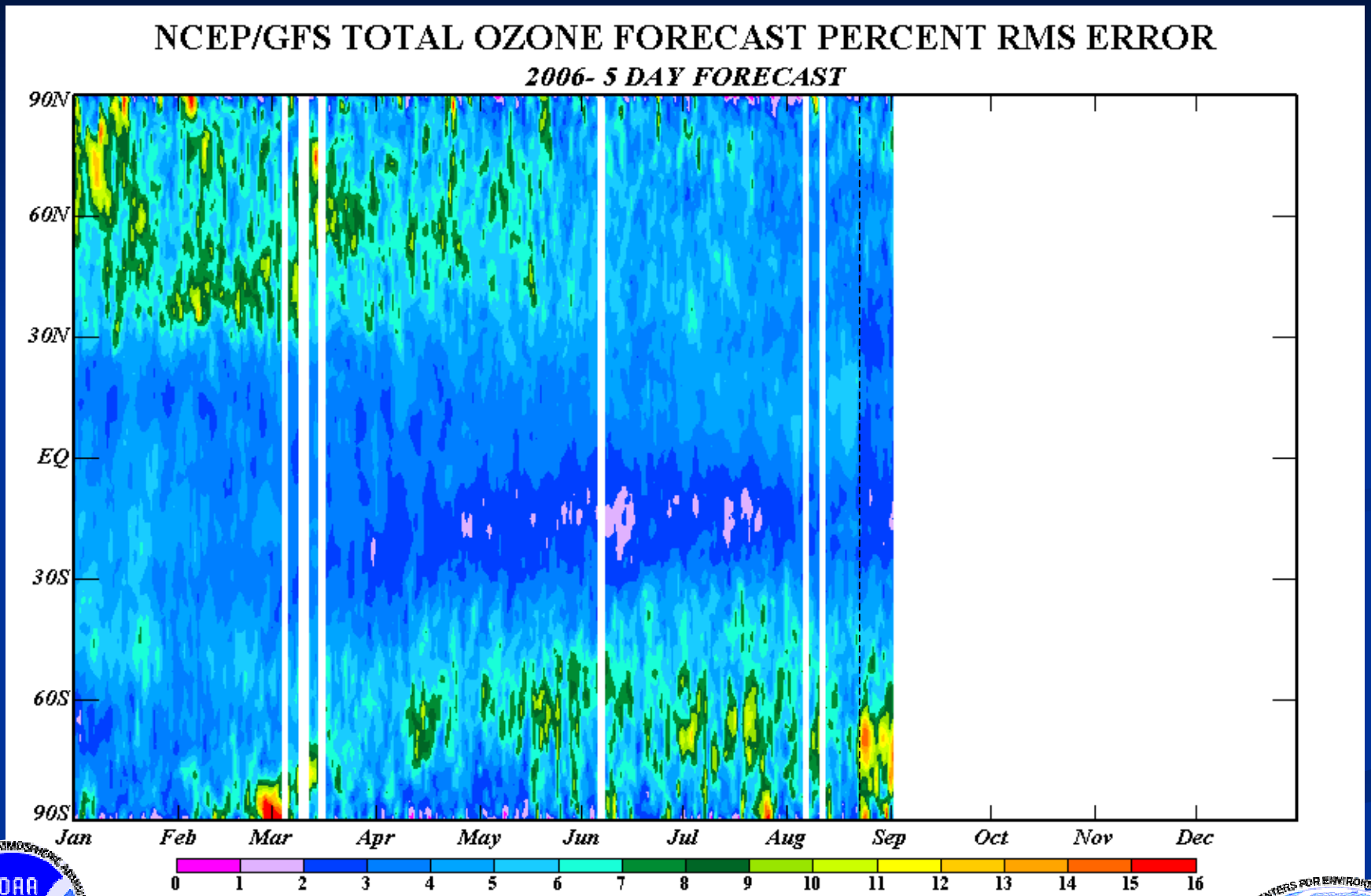
Parallel



NRL P/L Code Impacts



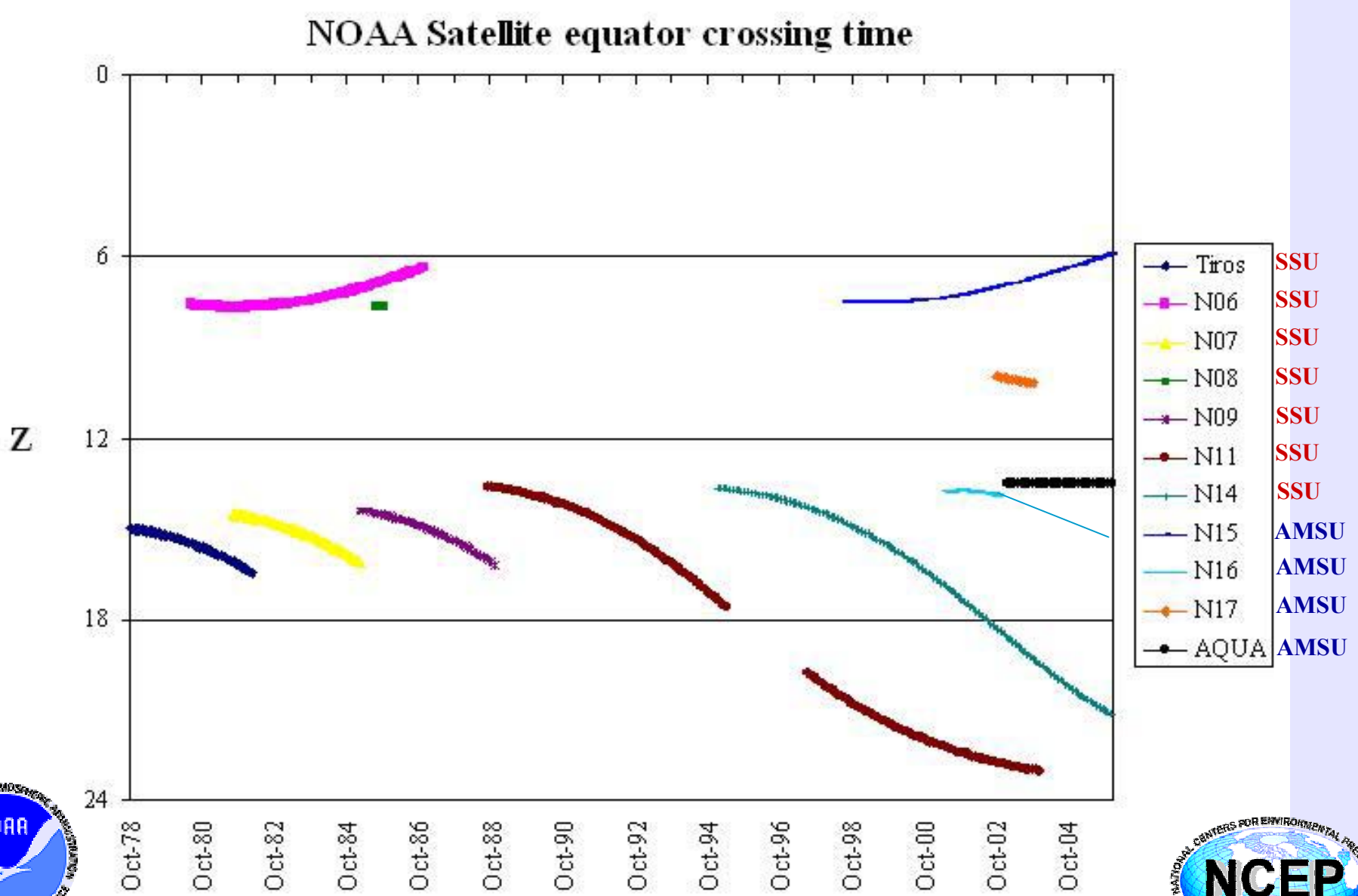
NRL P/L Code Impacts



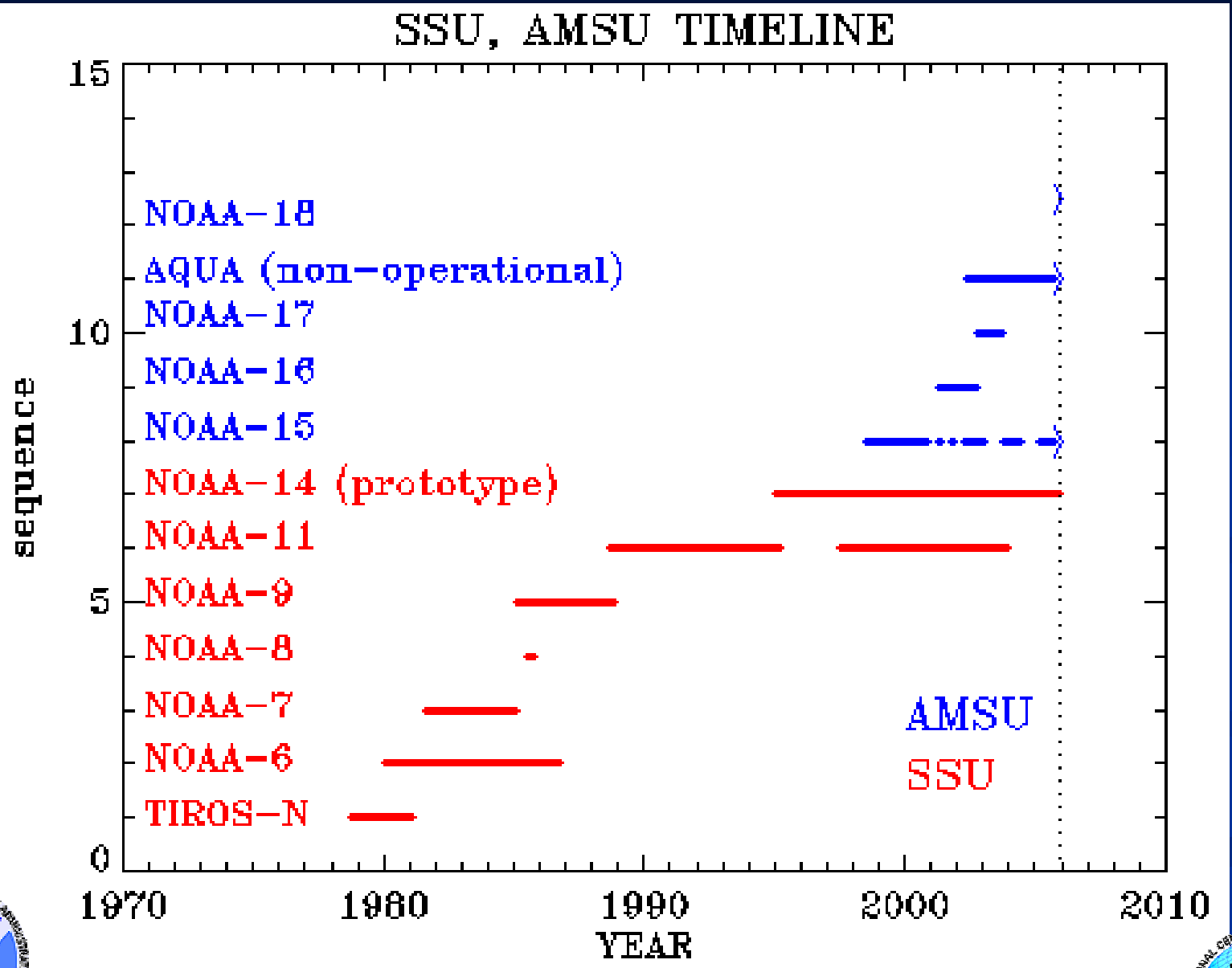
CPC Long Term Data Sets

- SSU/AMSU Temperature Climate dataset.
  - Collaboration with John Nash (UKMO).
- SBUV/2 Total Ozone data set.
  - Combined several NASA & NOAA SBUV(/2) obs.
  - Version 8
- SBUV/2 Profile Ozone data set.
  - Combined several NASA & NOAA SBUV(/2) obs.
  - Version 8

CPC SSU/AMSU Temperature Data Set

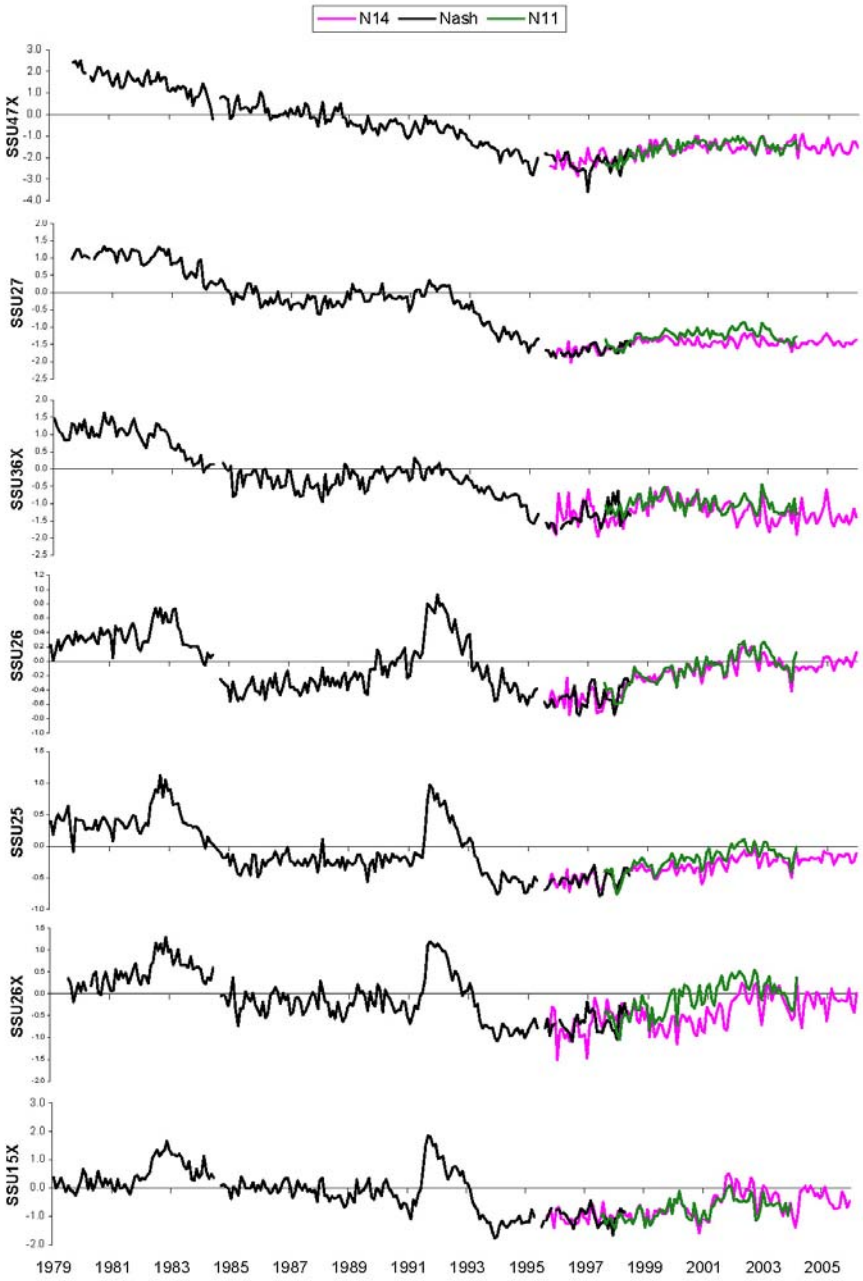


CPC SSU/AMSU Temperature Data Set



CPC SSU/AMSU Temperature Data Set

Global Average
70N-70S



0.5 hPa

1.5 hPa

2 hPa

6 hPa

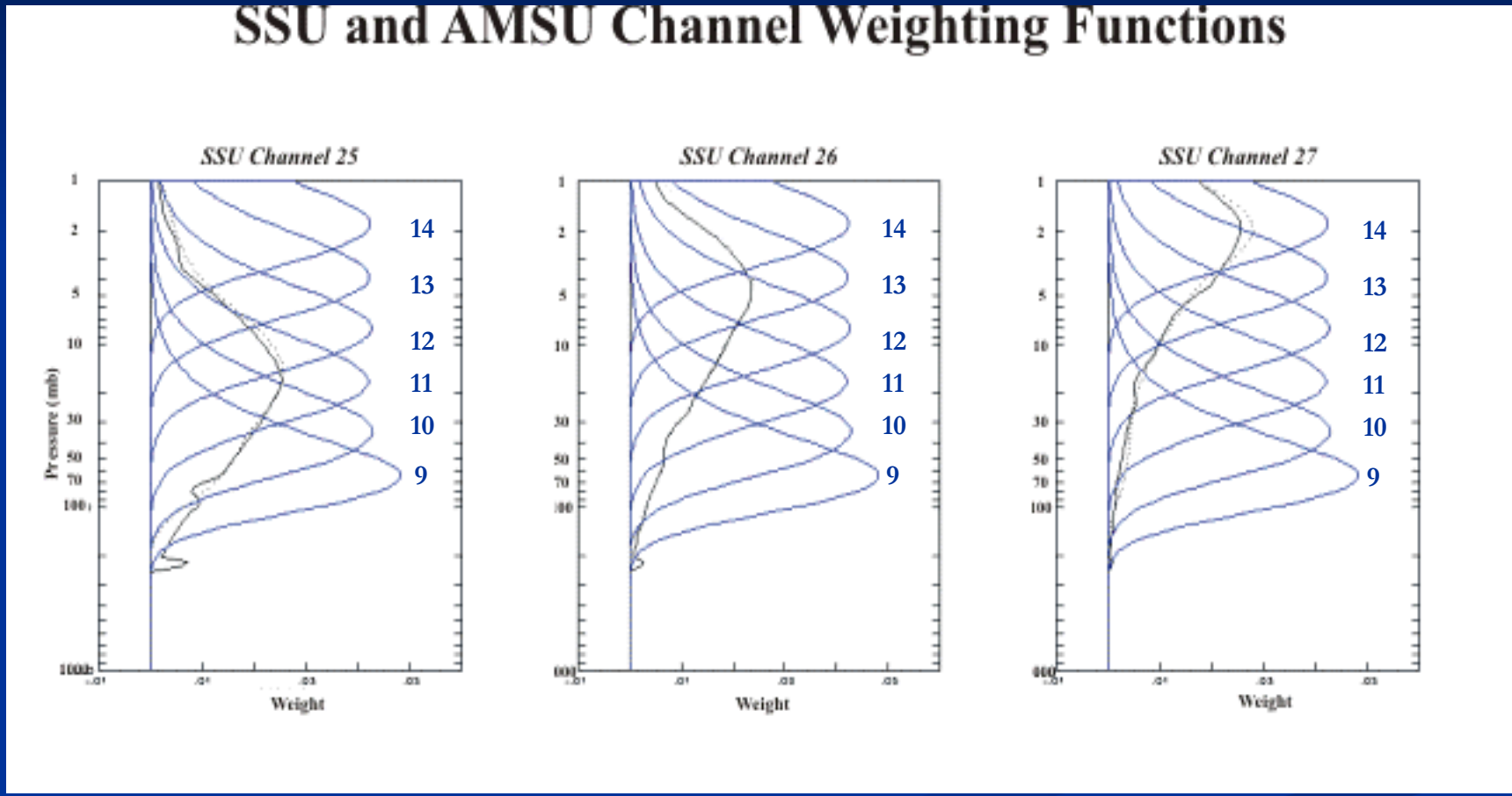
15 hPa

20 hPa

50 hPa

CPC SSU/AMSU Temperature Data Set

All available AMSU channels (9-14) are used to replicate the SSU channels.



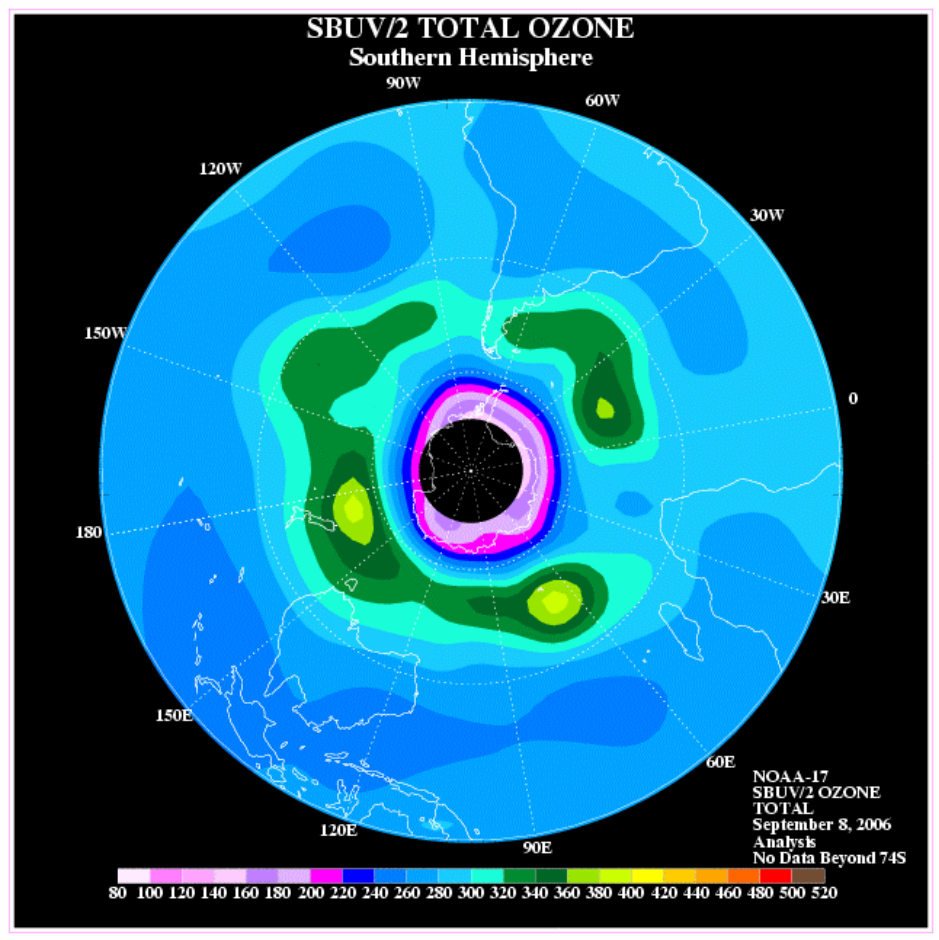
CPC & NESDIS SBUV/2 Data Sets

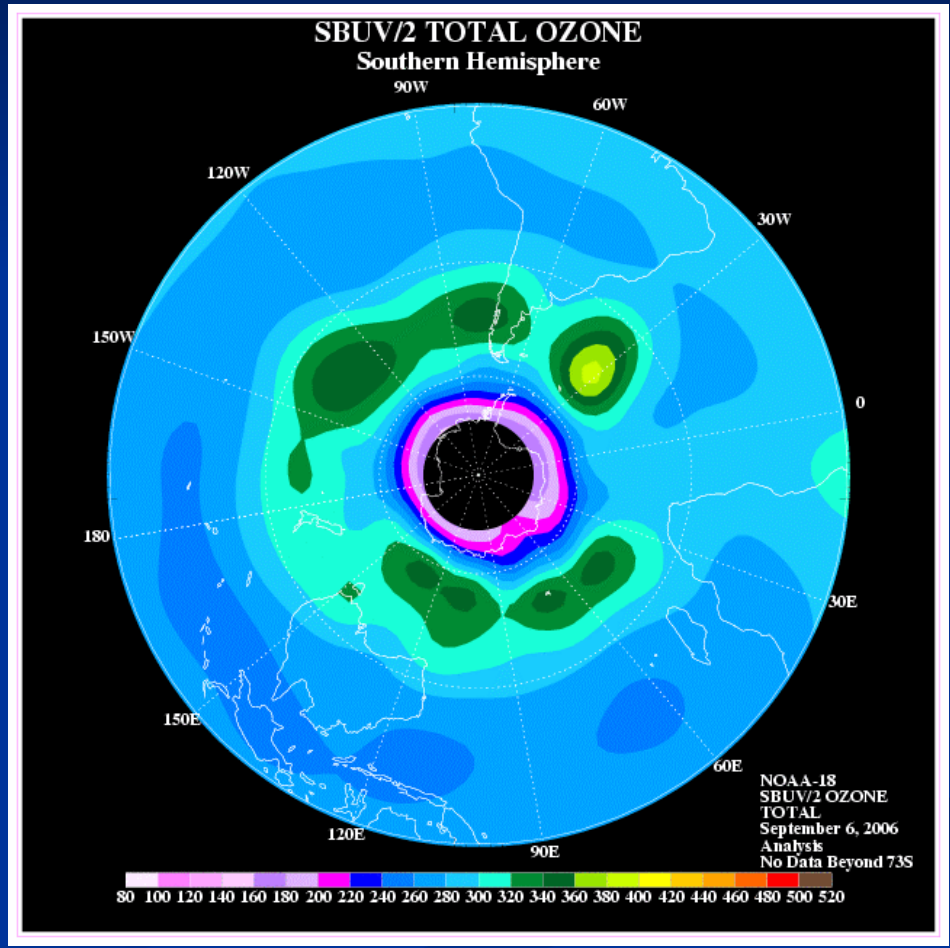
- Currently three SBUV/2 instruments are working operationally.
  - NOAA-16, NOAA-17, NOAA18
  - NOAA-16 Equator crossing time is drifting to later times.
  - NOAA-17 & NOAA-18 still have near stable Eq crossing times.
  - NOAA-18 calibrations coefficients have just been modified.
    - N18 now is in close agreement with N17
    - NOAA-18 and NOAA-17 have nearly the same ozone hole size.
  - Version 8 total ozone and profile products will be operationally produced by NESDIS in 2007.

2006 Ozone Hole Update

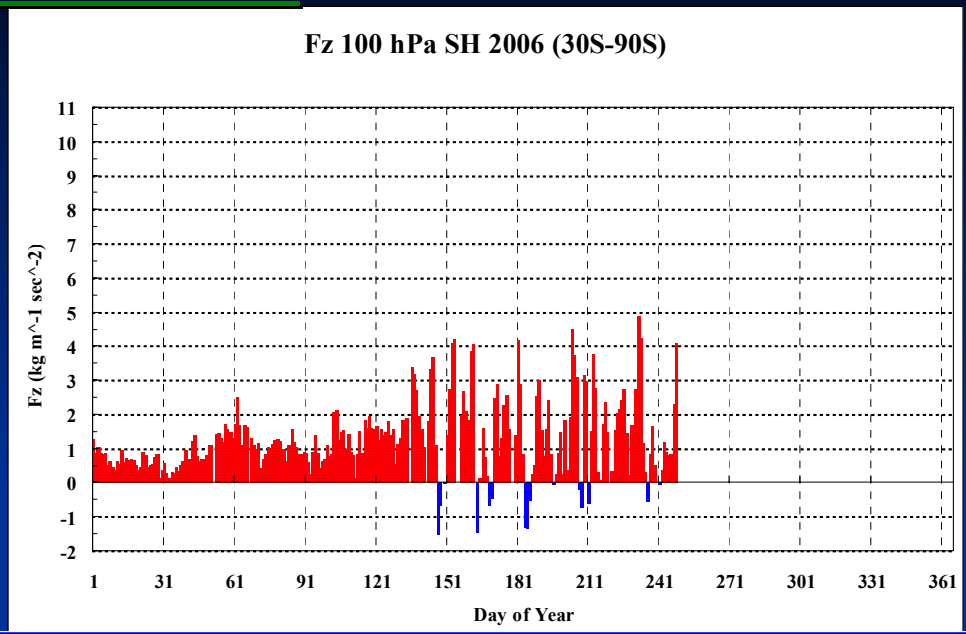
- Relatively large ozone hole
  - ~23-24 million sq kilometers.
  - Little wave activity.
  - Late or reduced subsidence from above may extend the longevity of the ozone hole.

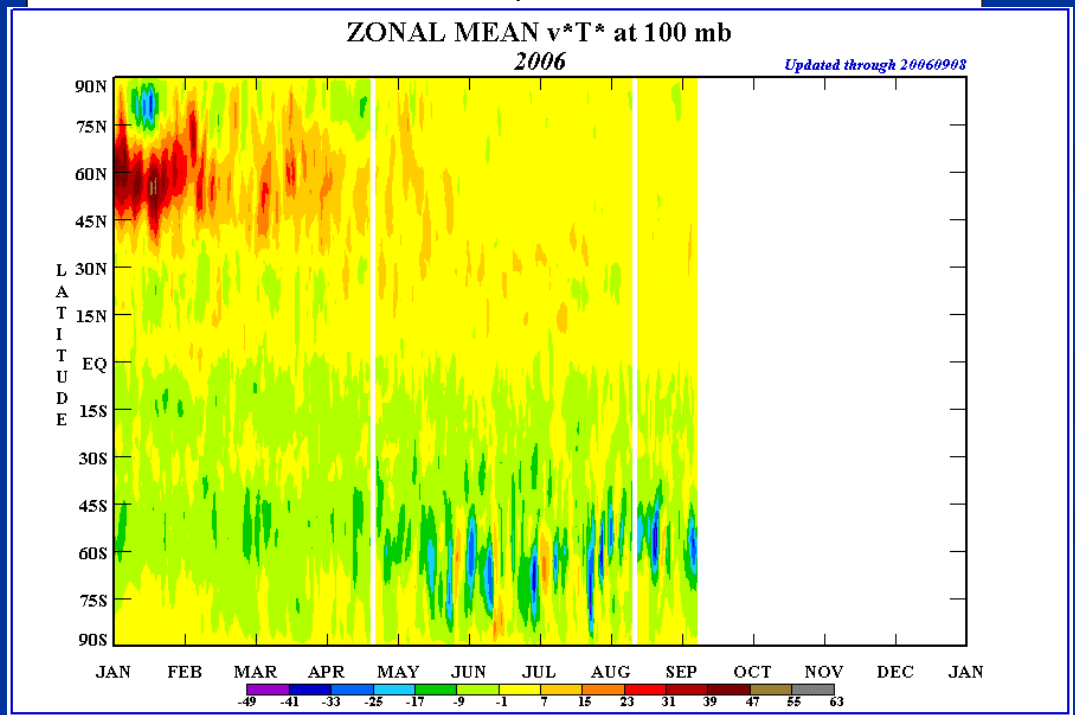
2006 Ozone Analyses from N17 & N18 SBUV/2



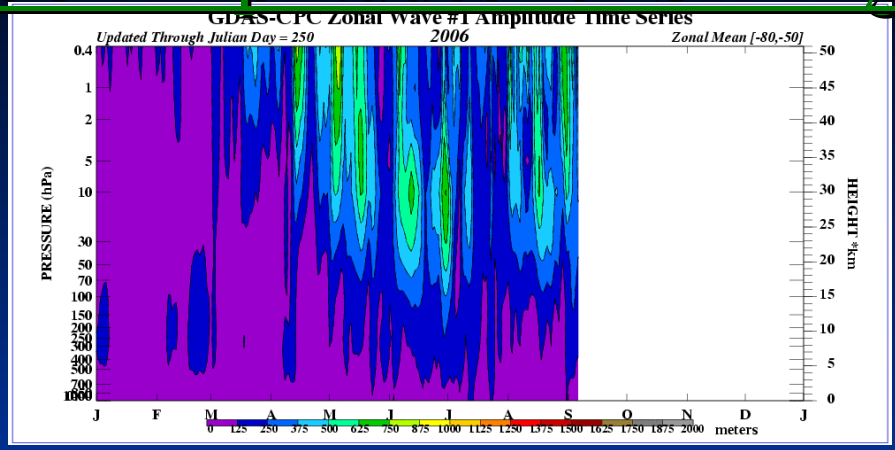


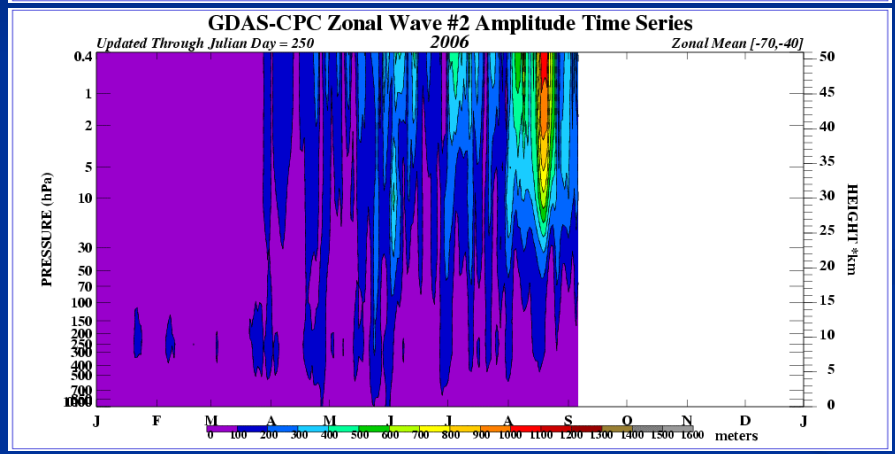
Meridional Heat Flux

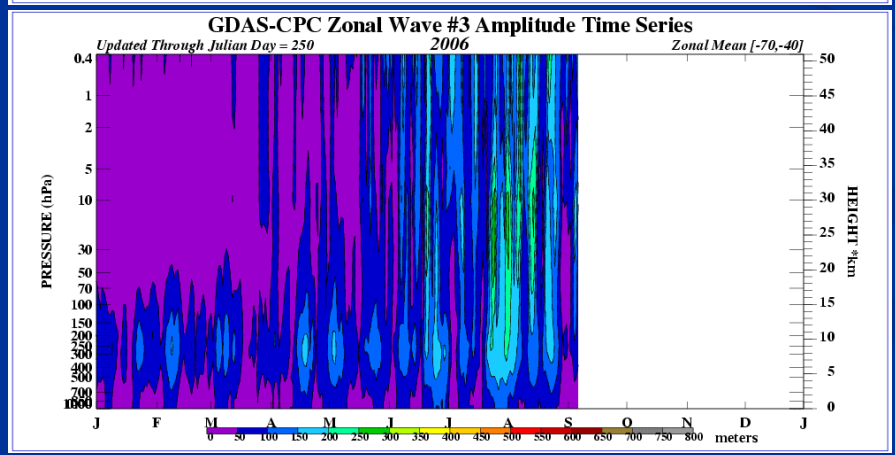




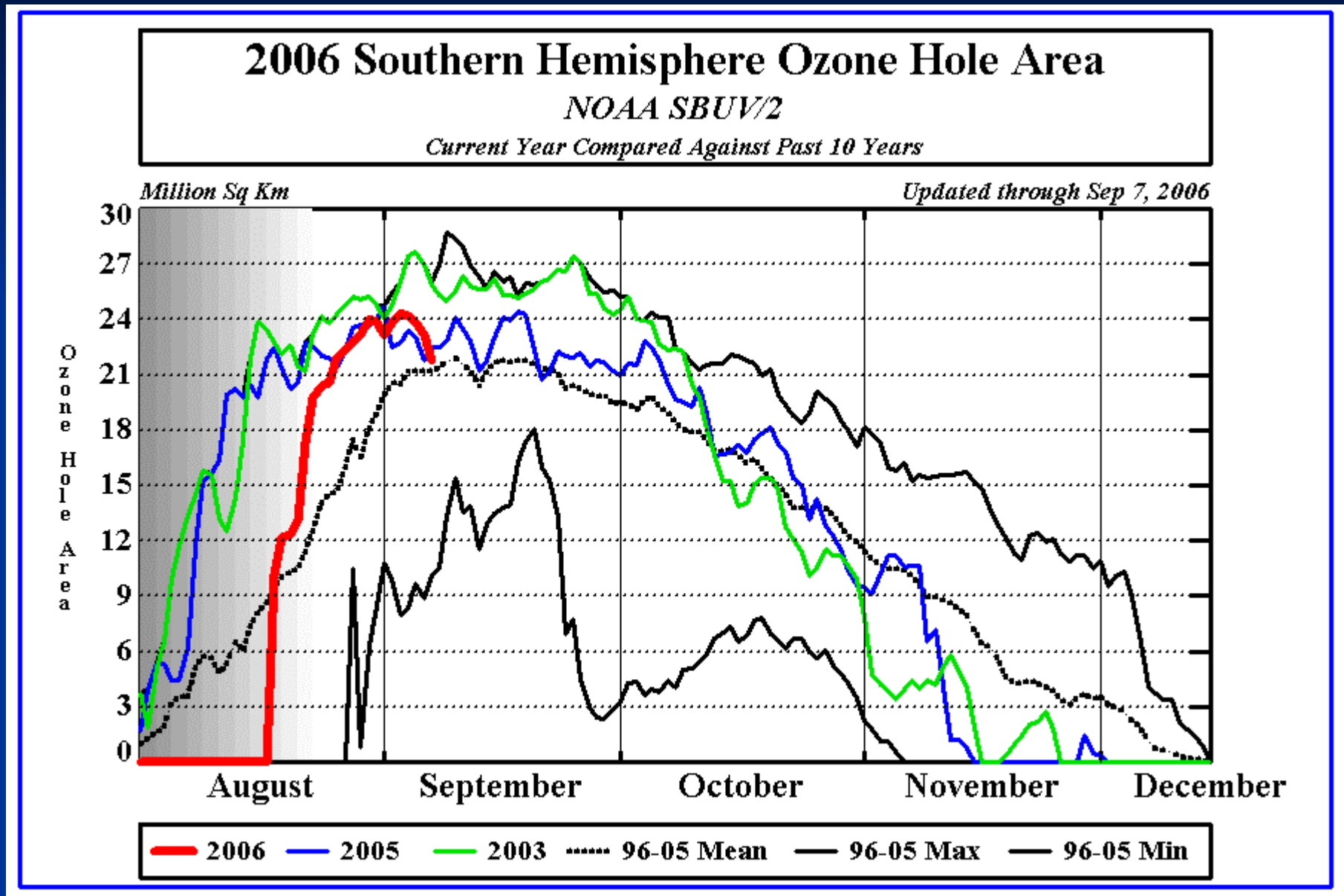
Wave 1, 2, & 3 Amplitudes for SH High Latitudes



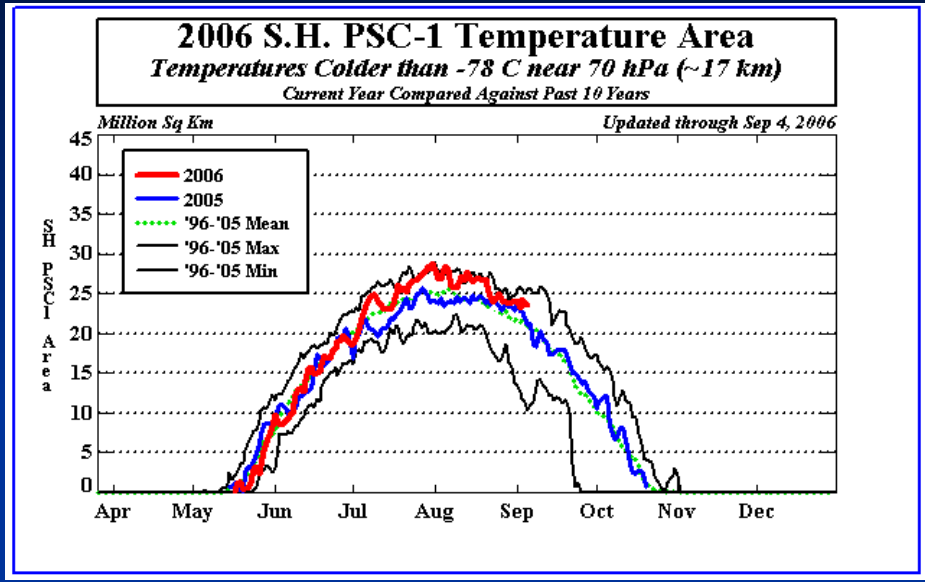


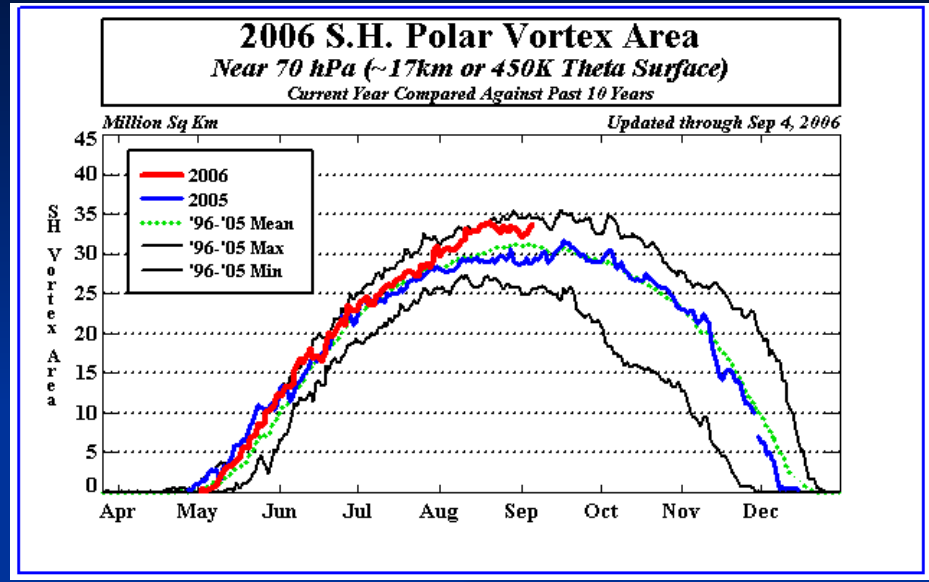


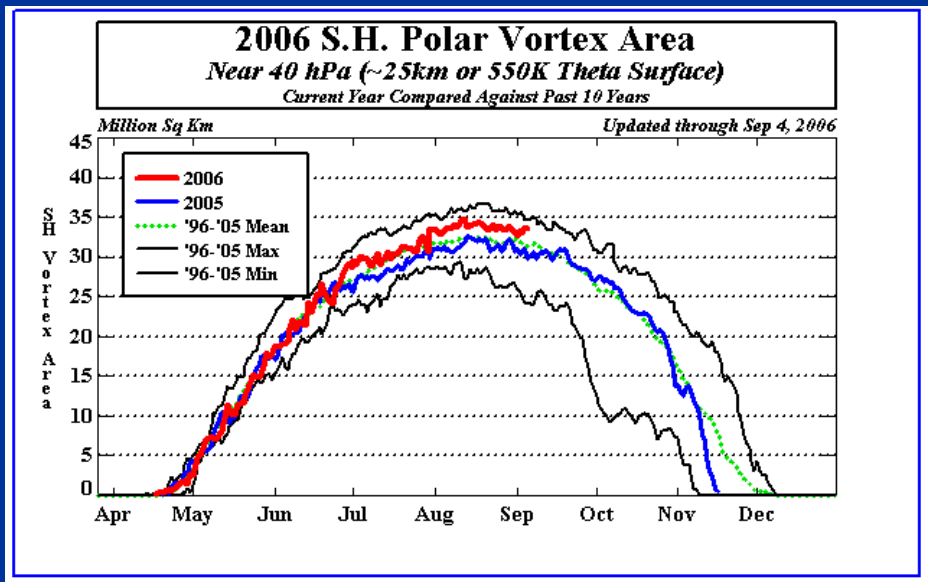
2006 Ozone Hole Size

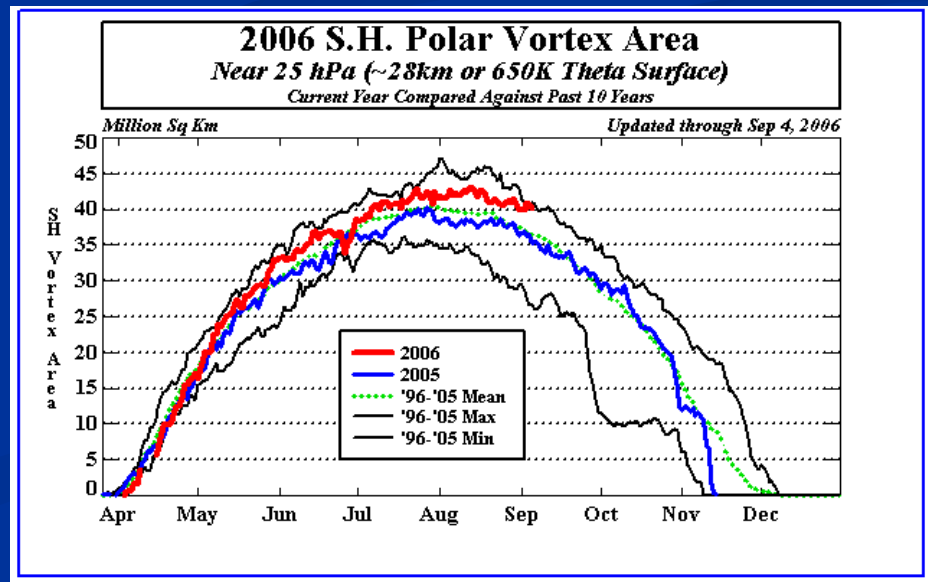


Areas of Various Indicators

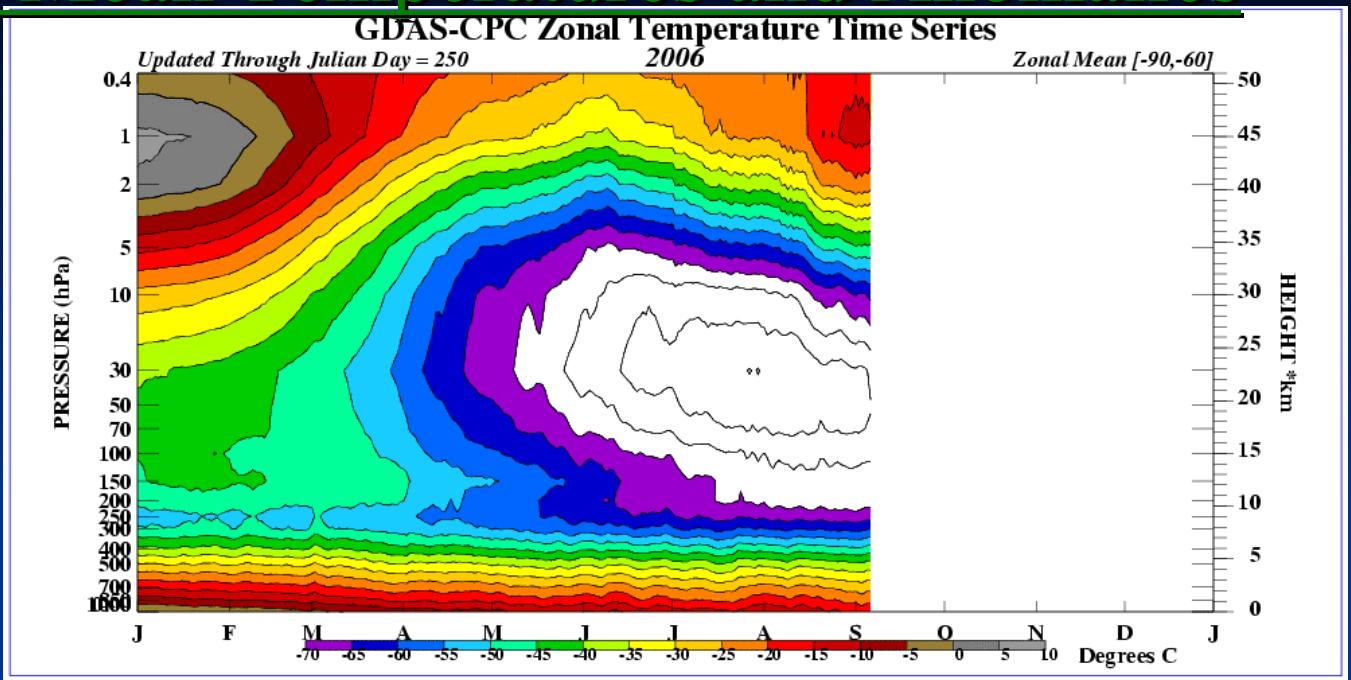


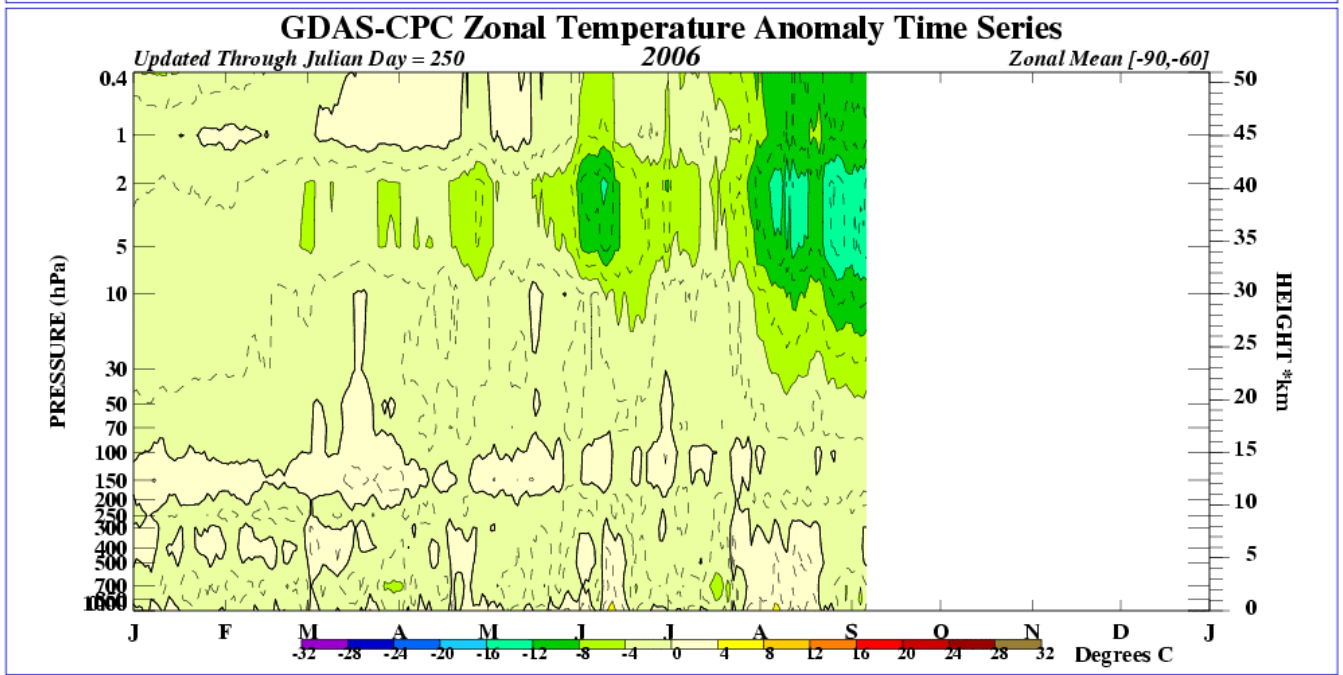




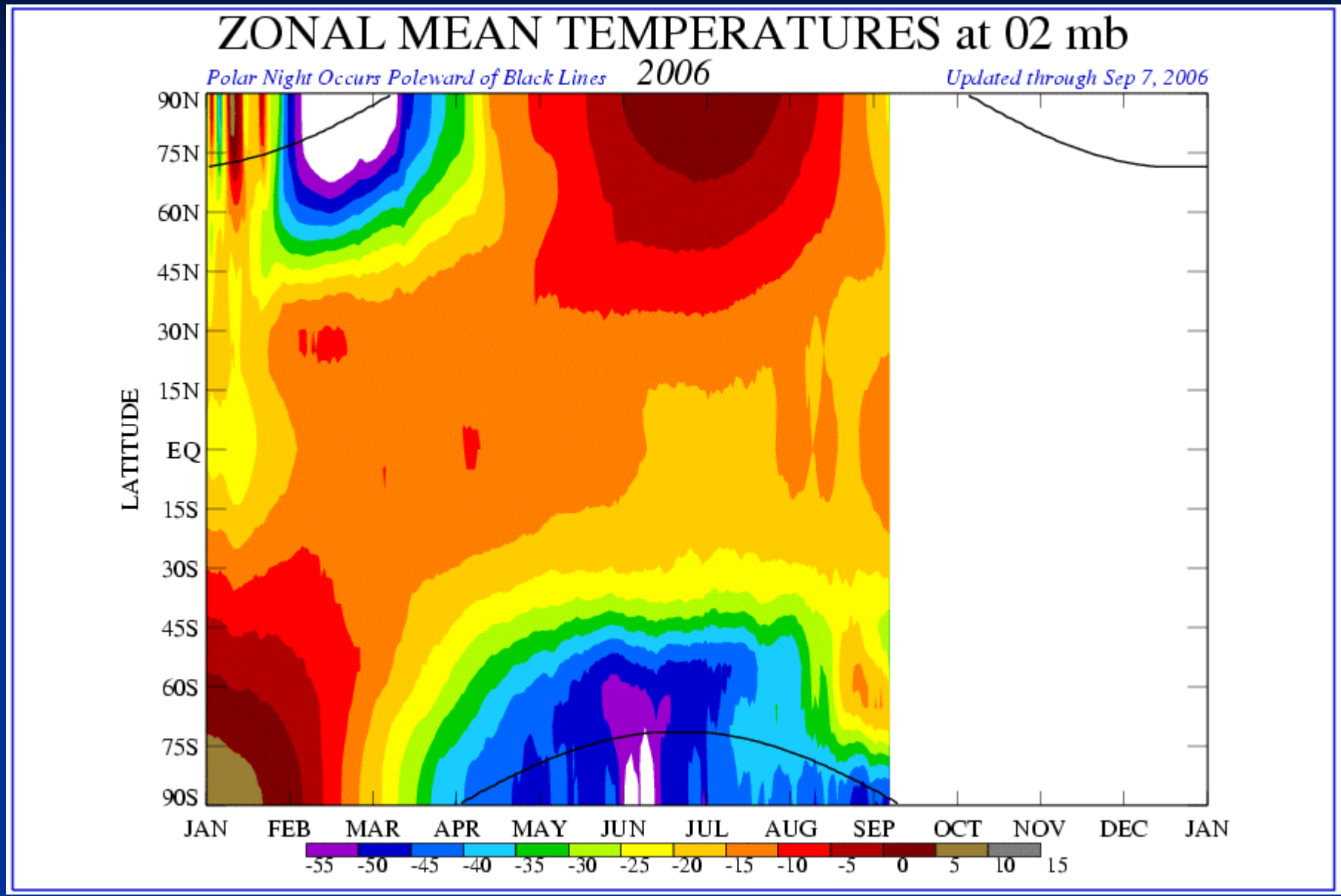


Zonal Mean Temperatures and Anomalies

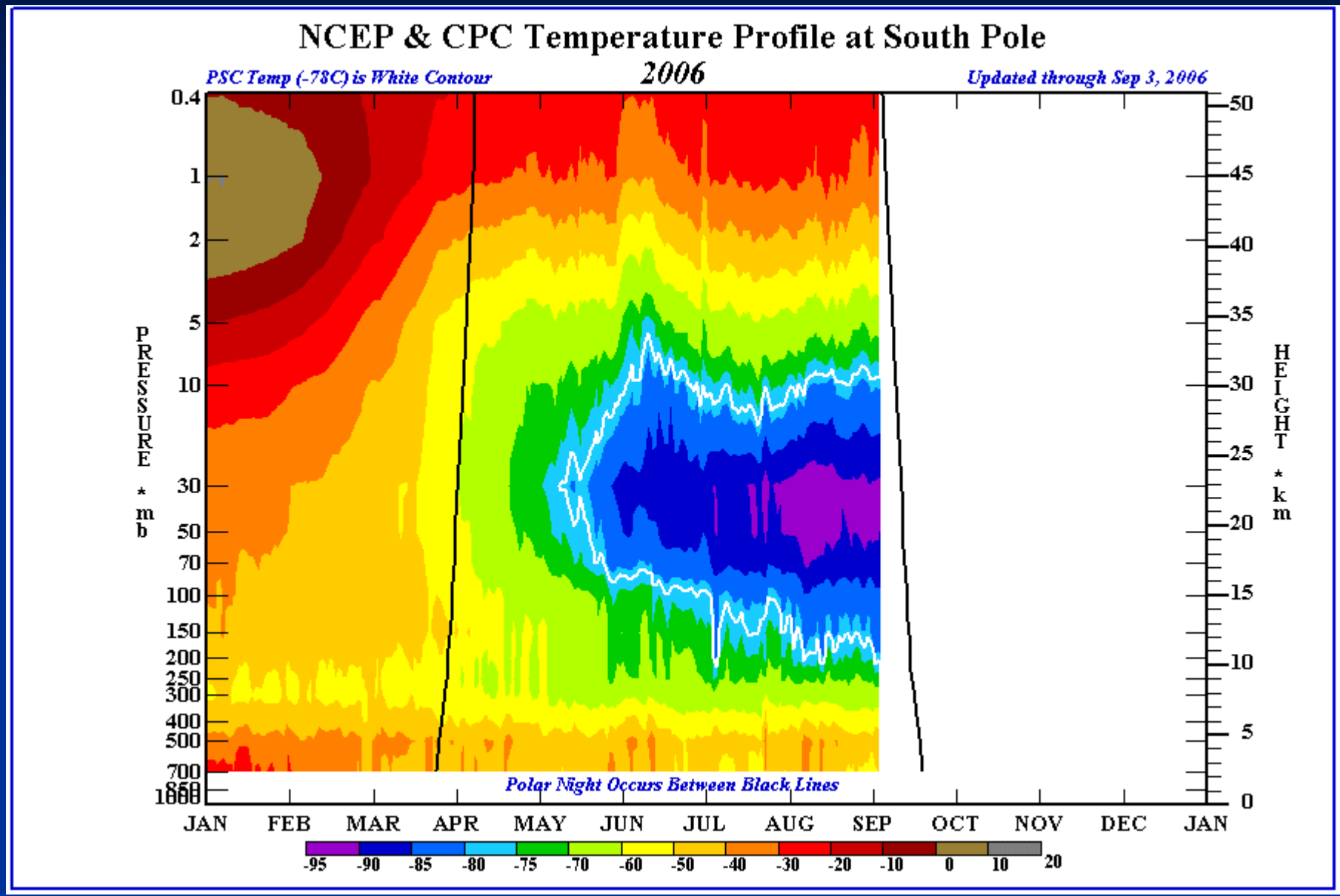




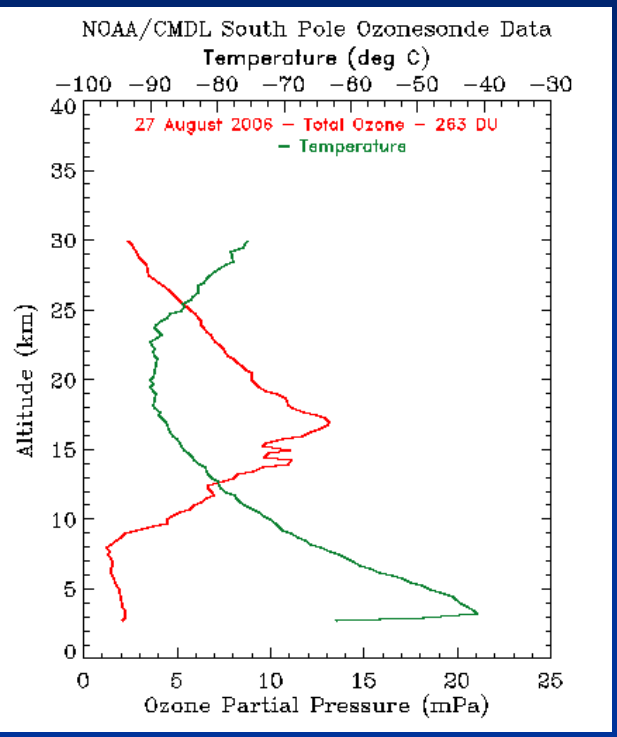
Time Series of 2 hPa Zonal Mean Temperatures

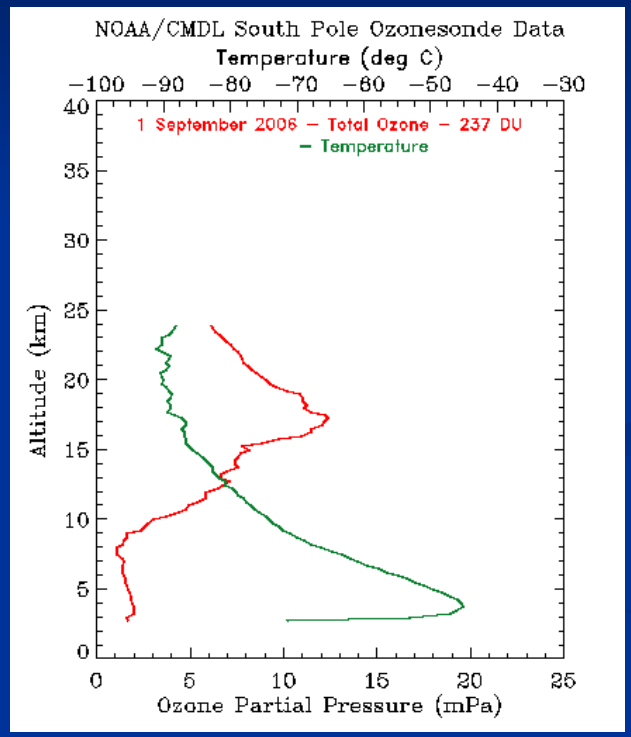


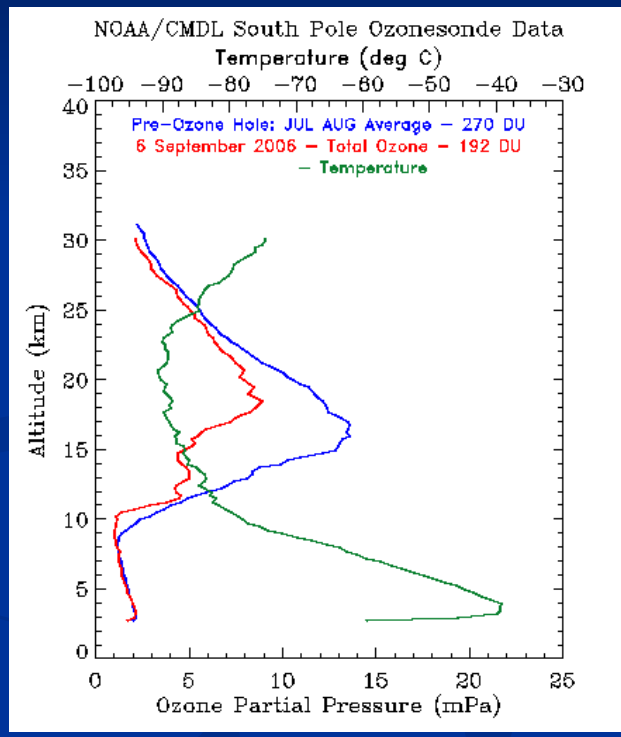
South Pole Temperature Time Series



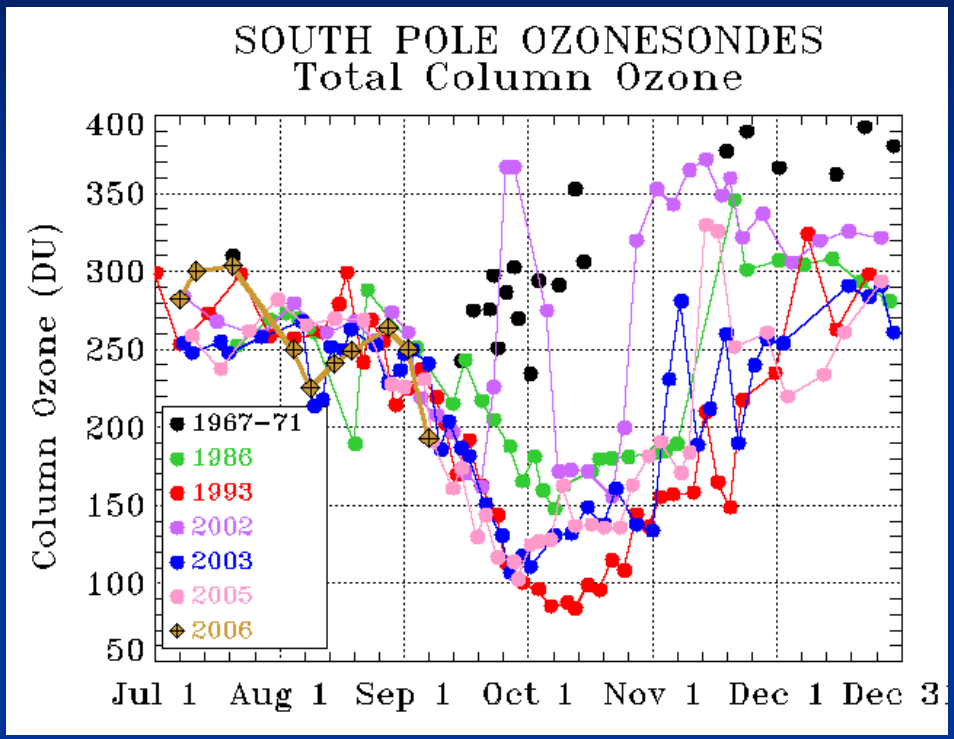
Ozonesonde Profiles Showing Erosion of Ozone in 12-25 km region

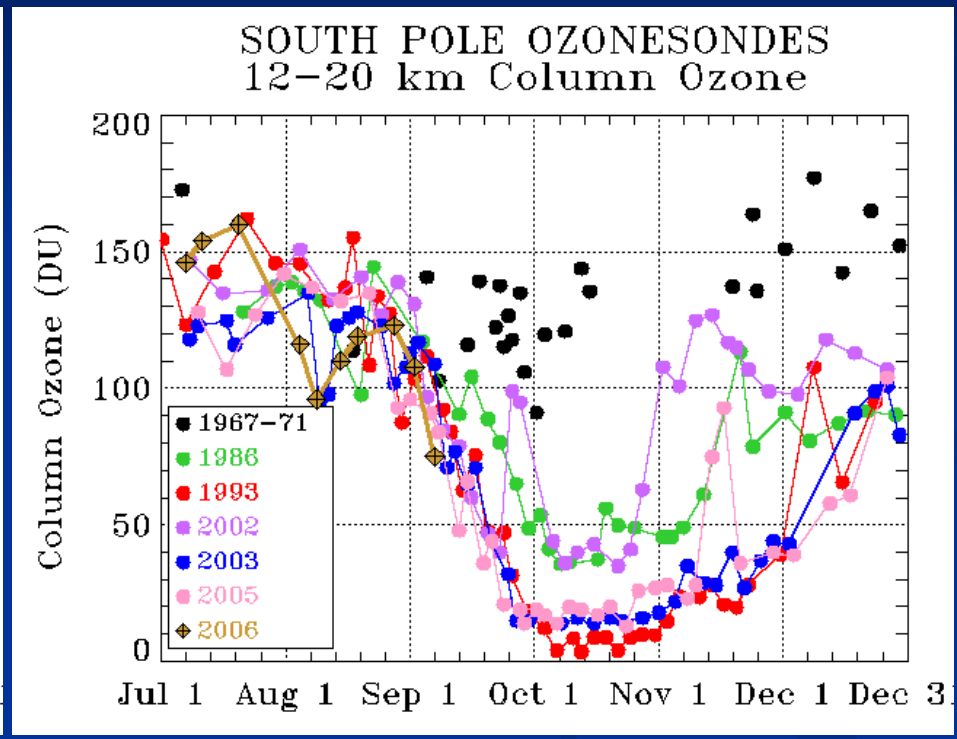






Time Series of Total and Partial Column Ozone from South Pole Ozonesondes





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